

**Remarks Made at the Task Force on Research Specific to Pregnant Women and Lactating Women in Bethesda, MD on August 22<sup>nd</sup>, 2017**

My name is Jonathan Bortz. I am an endocrinologist and was in practice for about 14 years and have been working in the pharmaceutical and ingredient industry for the last 14 years, where I have been responsible for developing products for women's health like prescriptive prenatal vitamins and iron replacement products.

Because these were all for the prescriptive market, I had to make sure that they would be prescribed by physicians and that each product would offer unique and valuable attributes in order for physicians to prescribe them rather than recommending OTC alternatives. This automatically set a very high bar for us to clear to ensure that the what was being promoted to doctors was backed up with great science and a good (and often novel) rationale.

This forced us to scour the world for unique and high quality ingredients that brought meaningful differentiation to the product. The right form of ingredient and the right dose needed to meet the therapeutic goals of the product. Each and every ingredient had to earn its way into the formulation. We were never interested in just putting a composition together with 15 different vitamins and minerals just to make label claims.

This process also led us to seek and exploit emerging science and develop concepts that would never have come to being if we relied only on conventional knowledge of vitamins and minerals. We subjected the nutrient ingredients to the same scientific scrutiny and rigor that is accepted for small molecule pharmaceuticals and essentially developed a method of creating new product concepts by properly exploiting little known or poorly understood facts about each nutrient ingredient. In other words, we treated nutrients like the Agency would like us to treat small molecules.

Here is an example of what I mean. Folic acid is the backbone of all prenatal vitamins because it is well understood to play a significant role in reducing birth defects. This is a main reason that it is part of the mandated food fortification program in the US. Well, supplementing folate a very successful strategy for reducing Neural Tube Defects, but is just the tip of the iceberg in terms of the sort of positive impact nutritional intervention can have on the outcome of the pregnancy. You see, folate, vitamin B12 and choline are responsible for a key metabolic system called Single Carbon Metabolism that plays a critical role in a variety of important neurodevelopmental, metabolic and genetic functions. Adequate supply of all three of these nutrients has been shown to reduce Neural Tube defects like spina bifida and anencephaly as well as significantly impact neurodevelopmental milestones – and yet doctors and patients don't know about these other two players. They only know about folic acid.

Folic acid is also the synthetic form of the vitamin and behaves differently to the natural form, folate. Supplemented folic acid lands up in mother's milk, binding to the protein Folate Receptor  $\alpha$  (FR $\alpha$ ) that ordinarily binds to the natural folate. But the folic acid binds more avidly and therefore displaces or prevents folate from binding to these proteins and hence this may reduce the bioavailability of folate to the nursing infant. Nobody knows that and yet doctors and consumers think that all vitamins and minerals are the same. They are not. The attitude that folic is folic, or iron is iron is iron is just not true, and it is we in industry that are motivated to tease out the differences and develop products that have true benefits and teach the marketplace about ones that don't or may in fact be potentially problematic or have unintended consequences.

This also puts industry in a place where conventional science can't go – looking for science that can teach us, not dated science that just maintains the status quo. We can bridge the gap that academia and policy makers can't readily access, and we are motivated to show that these innovations are truly different from the pedestrian approach seen in most OTC products. Prescription products are NOT the same as OTCs and the prescriptive companies are promoting this message – backed up by science and appropriate messaging, because by treating all vitamins and all minerals the same, as low tech ingredients is literally a case of 'throwing the baby out with the bathwater.'

Thank you.